

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2019/2020

EET1156 – BASIC ELECTRICAL TECHNOLOGY
(ME)

11 MARCH 2020
2.30 PM – 4.30 PM
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 6 pages including cover page with 4 Questions only.
2. Attempt **ALL** the questions. The distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

Question 1

(a) Consider a 230V, 100W incandescent lamp. Determine:

- (i) the lamp resistance, [2 marks]
- (ii) the lamp current, and [2 marks]
- (iii) the energy consumed by the lamp in 400 minute [2 marks]

(b) Find the current supplied by the voltage source. [8 marks]

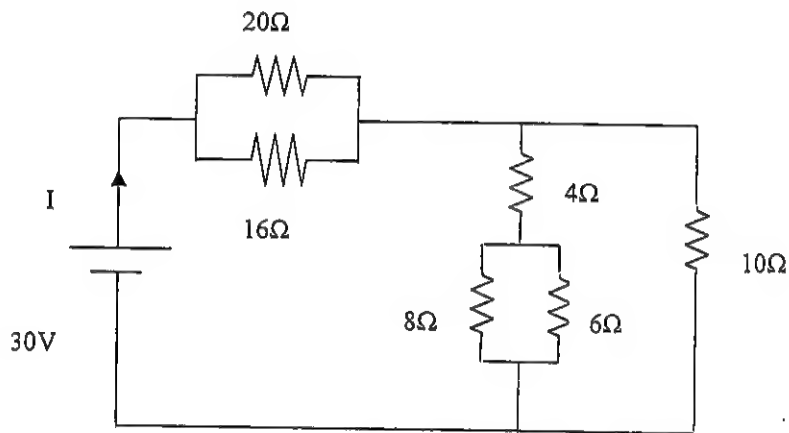


Figure Q1 (a)

(c) Find the Thevenin and Norton equivalents of the circuit as shown in Figure Q1(b) at terminal ab. [16 marks]

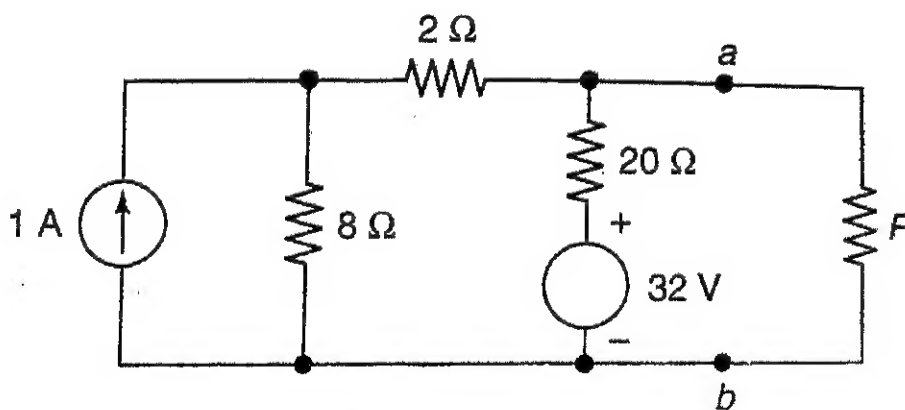


Figure Q1 (b)

Continued...

Question 2

- (a) A charge of $1.5\mu\text{C}$ is carried on two parallel plates each measuring $10\text{cm} \times 5\text{cm}$. Calculate the electric flux density. If the plates are 1cm apart and the voltage between them is 500V , determine the electric field strength and energy stored. [5 marks]
- (b) In the circuit given below, $C_1=60\mu\text{F}$, $C_2=20\mu\text{F}$, $C_3=9\mu\text{F}$ and $C_4=12\mu\text{F}$. If the potential difference between points a and b, $V_{ab}=120\text{V}$, find the charge of the second capacitor. [11 marks]

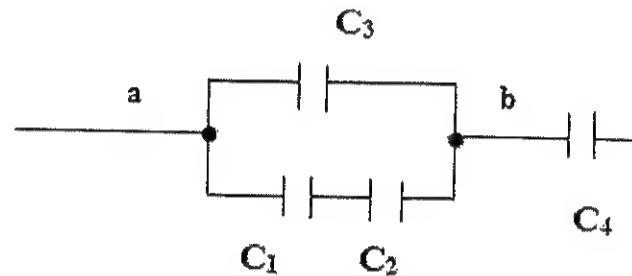


Figure Q2 (a)

- (c) A ring of magnetic material has relative permeability of 6000. The inner diameter of the ring is 10cm and the outer diameter 16cm . An air gap of 1mm is cut across the ring. The ring is wound with 500 turns carrying a current of 2A . Find the following:
- (i) total reluctance, R [5 marks]
 - (ii) flux density in the air gap, B_g [2 marks]
 - (iii) intensity of the core, H_c [2 marks]

Continued...

Question 3

- (a) What are the name and the function of the circuit shown in Figure Q3 (a)? Sketch the input and output waveform for the circuit for positive and negative cycle. [7 marks]

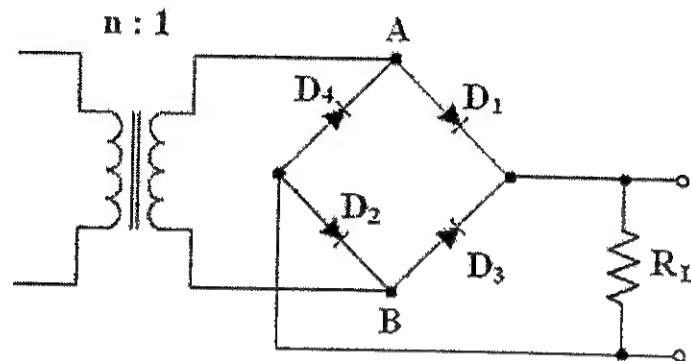


Figure Q3 (a)

- (b) Figure Q3 (b) shows a transistor circuit bias. If $\beta_{DC} = 120$, determine

- | | | |
|-------|----------------|------------|
| (i) | I_B , | [2 marks] |
| (ii) | I_C , | [1 mark] |
| (iii) | I_E , | [1 mark] |
| (iv) | V_{BE} , | [2 marks] |
| (v) | V_{CE} , and | [2 marks] |
| (vi) | V_{CB} | [2 marks] |

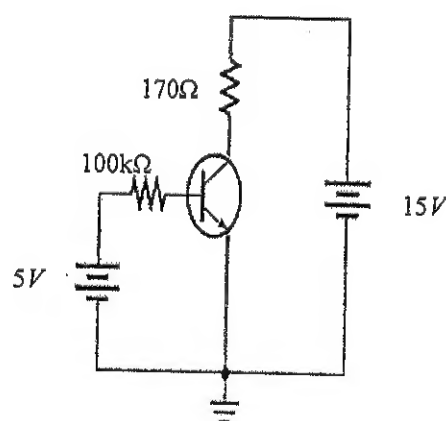


Figure Q3 (b)

Continued...

(ii) Refer to the amplifier in Figure Q3(c). Determine the following:

(i) V_{R1} and V_{R2}

[2 marks]

(ii) Current through R_f

[4 marks]

(iii) V_{out}

[2 marks]

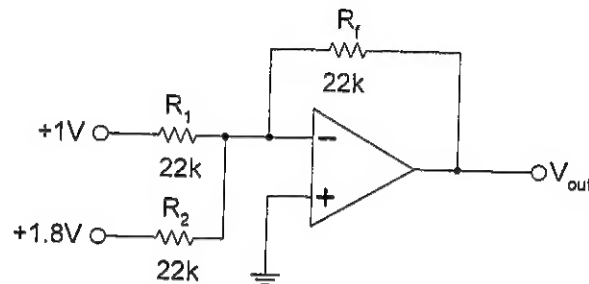


Figure Q3 (c)

Question 4

(a) Simplify the functions below by using Boolean Algebra

(i) $(A+B)(A+C)$

[3 marks]

(ii) $\bar{A}(A+B) + (B+AA)(A+\bar{B})$

[3 marks]

(b) Write the logic function for the logic circuit in Figure Q4 (a) and compute the *truth table*. What is the final simplified output function, Y?

[7 marks]

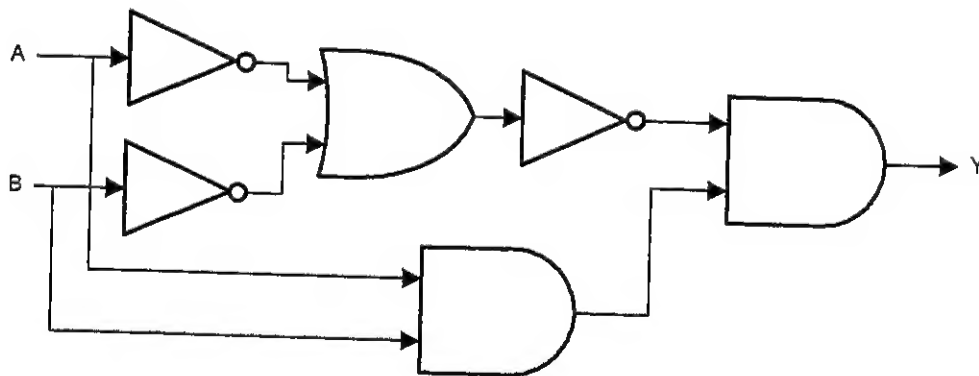


Figure Q4 (a)

Continued...

- (c) (i) Determine the simplified function (SOP) from the Karnaugh map shown in Table Q4. [4 marks]

Table Q4

AB C	00	01	11	10
0	1	1	0	0
1	1	1	0	1

- (ii) Draw the simplified logic circuit with the SOP obtained above. [3 marks]

End of paper.